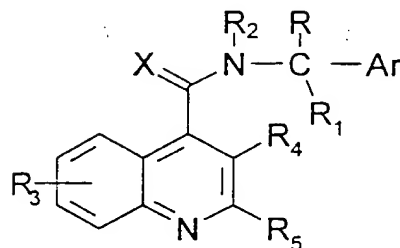


Claims

1. A compound, or solvate or salt thereof, of formula (I):



5

(I)

in which:

Ar is an optionally substituted phenyl, naphthyl or C₅₋₇ cycloalkdienyl group, or an optionally substituted single or fused ring heterocyclic group, having aromatic character, containing from 5 to 12 ring atoms and comprising up to four hetero-atoms in the or each ring selected from S, O, N;

10

R is linear or branched C₁₋₈ alkyl, C₃₋₇ cycloalkyl, C₄₋₇ cycloalkylalkyl, optionally substituted phenyl or phenyl C₁₋₆ alkyl, an optionally substituted five-membered heteroaromatic ring comprising up to four heteroatoms selected from O and N, hydroxy C₁₋₆ alkyl, amino C₁₋₆ alkyl, C₁₋₆ alkylaminoalkyl, di C₁₋₆ alkylaminoalkyl, C₁₋₆ acylaminoalkyl, C₁₋₆ alkoxyalkyl, C₁₋₆ alkylcarbonyl, carboxy, C₁₋₆ alkoxyxcarbonyl, C₁₋₆ alkoxycarbonyl C₁₋₆ alkyl, aminocarbonyl, C₁₋₆ alkylaminocarbonyl, di C₁₋₆ alkylaminocarbonyl, halogeno C₁₋₆ alkyl; or is a group -(CH₂)_p- when cyclized onto Ar, where p is 2 or 3.

15

R₁ and R₂, which may be the same or different, are independently hydrogen or C₁₋₆ linear or branched alkyl, or together form a -(CH₂)_n- group in which n represents 3, 4, or 5; or R₁ together with R forms a group -(CH₂)_q-, in which q is 2, 3, 4 or 5.

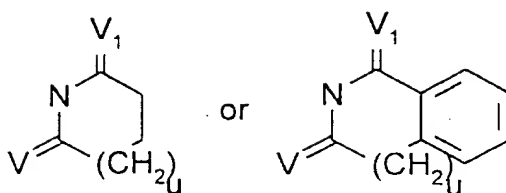
20

R₃ and R₄, which may be the same or different are independently hydrogen, C₁₋₆ linear or branched alkyl, C₁₋₆ alkenyl, aryl, C₁₋₆ alkoxy, hydroxy, halogen, nitro, cyano, carboxy, carboxamido, sulphonamido, C₁₋₆ alkoxycarbonyl, trifluoromethyl, acyloxy, phthalimido, amino, mono- and di-C₁₋₆ alkylamino,

25

-O(CH₂)_r-NT₂, in which r is 2, 3, or 4 and T is hydrogen or C₁₋₆ alkyl or it forms with the adjacent nitrogen a group

30



in which V and V₁ are independently hydrogen or oxygen and u is 0,1 or 2;
 -O(CH₂)_s-OW₂ in which s is 2, 3, or 4 and W is hydrogen or C₁₋₆ alkyl;
 hydroxyalkyl, aminoalkyl, mono- or di-alkylaminoalkyl, acylamino,
 5 alkylsulphonylamino, aminoacylamino, mono- or di-alkylaminoacylamino;
 with up to four R₃ substituents being present in the quinoline nucleus;
 or R₄ is a group -(CH₂)_t- when cyclized onto R₅ as aryl, in which t is 1, 2,
 or 3;

R₅ is branched or linear C₁₋₆ alkyl, C₃₋₇ cycloalkyl, C₄₋₇ cycloalkylalkyl,
 10 optionally substituted aryl, or an optionally substituted single or fused ring
 heterocyclic group, having aromatic character, containing from 5 to 12 ring
 atoms and comprising up to four hetero-atoms in the or each ring selected
 from S, O, N;

X is O, S, or N-C≡N.

15

2. A compound according to claim 1 in which:

Ar is phenyl, optionally substituted by C₁₋₆ alkyl or halogen; thienyl or a C₅₋₇
 cycloalkdienyl group;

20 3. A compound according to claim 1 in which:

R is C₁₋₆ alkyl, C₁₋₆ alkoxy, C₁₋₆ alkylcarbonyl or hydroxy C₁₋₆
 alkyl.

4. A compound according to claim 1 in which:

25 R₁ and R₂ are each hydrogen or C₁₋₆ alkyl.

5. A compound according to claim 1 in which:

R₃ is hydrogen, hydroxy, halogen, C₁₋₆ alkoxy or C₁₋₆ alkyl.

30 6. A compound according to claim 1 in which:

R₄ is hydrogen, C₁₋₆ alkyl, C₁₋₆ alkoxy, hydroxy, amino, halogen,
 aminoalkoxy, mono- or di-alkylaminoalkoxy, mono- or di-alkylaminoalkyl,
 phthaloylalkoxy, mono- or di-alkylaminoacylamino or acylamino;

7. A compound according to claim 1 in which:

R₅ is phenyl, thienyl, furyl, pyrrolyl or thiazolyl.

8. A compound of formula (I) according to claim 1, or a salt or solvate thereof, in which:

Ar is phenyl, 2-chlorophenyl, 2-thienyl or cyclohexadienyl;

R is methyl, ethyl, n-propyl, -COOMe, or -COMe;

R₁ and R₂ are each hydrogen or methyl;

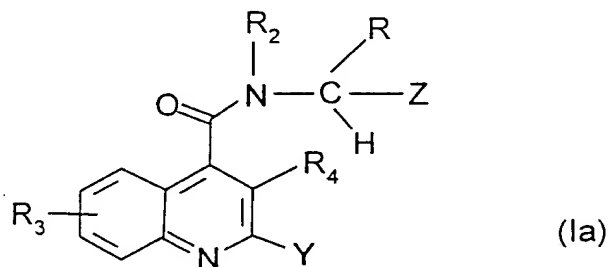
R₃ is hydrogen, methoxy, or hydroxy;

R₄ is hydrogen, methyl, ethyl, methoxy, hydroxy, amino, chlorine, bromine, dimethylaminoethoxy, 2-(1-phthaloyl)ethoxy, aminoethoxy, 2-(1-pyrrolidinyl)ethoxy, dimethylaminopropoxy, dimethylaminoacetyl amino, acetyl amino, or dimethylaminomethyl;

R₅ is phenyl, 2-thienyl, 2-furyl, 2-pyrrolyl, 2-thiazolyl or 3-thienyl;

and X is oxygen.

9. A compound according to claim 1, or a salt or solvate thereof, of formula (Ia)



in which

R, R₂, R₃ and R₄ are as defined for formula (I), in claim 1 and Y and Z, which may be the same or different, are each Ar as defined for formula (I) in claim 1.

10. A compound according to claim 9, of formula (Ib):

Ar above; examples of R₅ as a heterocyclic group are furyl, thienyl, pyrrol, thiazolyl, benzofuryl and pyridyl.

A preferred group of compounds of formula (I) are those in which:

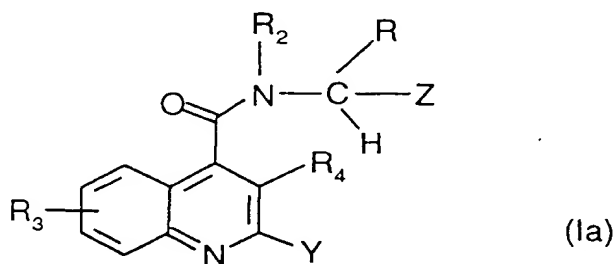
- 5 Ar is phenyl, optionally substituted by C₁₋₆ alkyl or halogen; thienyl or a C₅₋₇ cycloalkdienyl group;
R is C₁₋₆ alkyl, C₁₋₆ alkoxy, carbonyl, C₁₋₆ alkylcarbonyl, hydroxy C₁₋₆ alkyl;
R₁ and R₂ are each hydrogen or C₁₋₆ alkyl;
10 R₃ is hydrogen, hydroxy, halogen, C₁₋₆ alkoxy, C₁₋₆ alkyl;
R₄ is hydrogen, C₁₋₆ alkyl, C₁₋₆ alkoxy, hydroxy, amino, halogen, aminoalkoxy, mono- or di-alkylaminoalkoxy, mono- or di-alkylaminoalkyl, phthaloylalkoxy, mono- or di-alkylaminoacylamino and acylamino;
R₅ is phenyl, thienyl, furyl, pyrrol and thiazolyl.

15 A further preferred group of compounds of formula (I) are those in which:

- Ar is phenyl, 2-chlorophenyl, 2-thienyl or cyclohexadienyl;
R is methyl, ethyl, n-propyl, -COOMe, -COMe;
R₁ and R₂ are each hydrogen or methyl;
20 R₃ is hydrogen, methoxy, or hydroxy;
R₄ is hydrogen, methyl, ethyl, methoxy, hydroxy, amino, chlorine, bromine, dimethylaminoethoxy, 2-(1-phthaloyl)ethoxy, aminoethoxy, 2-(1-pyrrolidinyl)ethoxy, dimethylaminopropoxy, dimethylaminoacetyl amino, acetyl amino, and dimethylaminomethyl.
25 R₅ is phenyl, 2-thienyl, 2-furyl, 2-pyrrol, 2-thiazolyl and 3-thienyl; and X is oxygen.

A preferred sub-group of compounds within the scope of formula (I) above is of formula (Ia):

30



in which:

R, R₂, R₃ and R₄ are as defined in formula (I), and Y and Z, which may be the same or different, are each Ar as defined in formula (I).

- carboxamide;
- (-)-(R)-N-[α -(methoxycarbonyl)-1,4-cyclohexadienylmethyl]-2-phenylquinoline-4-carboxamide;
- (R,S)-N-[α -(1-hydroxyethyl)benzyl]-2-phenylquinoline-4-carboxamide
- 5 single diast;
- (R,S)-N-(α -ethylbenzyl)-3-methoxy-2-phenylquinoline-4-carboxamide;
- (R,S)-N-(α -ethylbenzyl)-3-n-butyl-2-phenylquinoline-4-carboxamide;
- (R,S)-N-[α -(methoxycarbonyl)benzyl]benzo-1,3-cycloheptadieno[1,2-b]quinoline-8-carboxamide;
- 10 (R,S)-N-(α -ethylbenzyl)-3-hexyl-2-phenylquinoline-4-carboxamide;
- (-)-(S)-N-(α -ethylbenzyl)-3-methyl-2-phenylquinoline-4-carboxamide;
- (+)-(R)-N-(α -ethylbenzyl)-3-methyl-2-phenylquinoline-4-carboxamide;
- (R,S)-N-[α -(methoxycarbonyl)benzyl]-2-(2-methoxyphenyl)quinoline-4-carboxamide;
- 15 (R,S)-N-(α -ethylbenzyl)-3-phenyl-2-phenylquinoline-4-carboxamide;
- (R,S)-N-[α -(methoxycarbonyl)benzyl]-2-(2-fluorophenyl)quinoline-4-carboxamide;
- (R,S)-N-[α -(ethyl)-3,4-dichlorobenzyl]-2-phenylquinoline-4-carboxamide;
- 20 (R,S)-N-[α -(hydroxymethyl)benzyl]-2-phenylquinoline-4-carboxamide;
- (R,S)-N-(α -ethylbenzyl)-2-phenylquinoline-4-carboxamide;
- (R,S)-N-[α -(methoxycarbonyl)benzyl]-3-methyl-2-phenylquinoline-4-carboxamide;
- (R,S)-N-(α -ethylbenzyl)-3-methyl-2-phenylquinoline-4-carboxamide;
- 25 (R,S)-N-[α -(methoxycarbonyl)benzyl]-7-chloro-2-phenylquinoline-4-carboxamide;
- (R,S)-N-[α -(methoxycarbonyl)benzyl]-6-methyl-2-phenylquinoline-4-carboxamide;
- (R,S)-N-[α -(methoxymethyl)benzyl]-2-phenylquinoline-4-carboxamide;
- 30 (R,S)-N-[α -(methoxycarbonyl)benzyl]-6-chloro-2-phenylquinoline-4-carboxamide;
- (R,S)-N-[α -(methoxycarbonyl)benzyl]-3-ethyl-2-phenylquinoline-4-carboxamide;
- (R,S)-N-(α -n-propylbenzyl)-2-phenylquinoline-4-carboxamide;
- 35 (R,S)-N-(α -ethylbenzyl)-3-ethyl-2-phenylquinoline-4-carboxamide;
- (R,S)-N-(α -ethylbenzyl)-3-phthalimido-2-phenylquinoline-4-carboxamide;

(R,S)-N-(α -ethylbenzyl)-3-n-propyl-2-phenylquinoline-4-carboxamide;
(-)-(S)-N-(α -ethylbenzyl)-6-bromo-3-methyl-2-(4-bromophenyl)quinoline-4-carboxamide;

5 (-)-(S)-N-(α -ethylbenzyl)-6-bromo-3-methyl-2-phenylquinoline-4-carboxamide;

(R,S)-N-[α -(methoxycarbonyl)benzyl]-6-methoxy-2-phenylquinoline-4-carboxamide;

(R,S)-N-[α -(methoxycarbonyl)benzyl]-2-(2-benzofuryl)quinoline-4-carboxamide;

10 (R,S)-N-[(1,2-diphenyl)ethyl]-2-phenylquinoline-4-carboxamide;

(R,S)-N-(α -trifluoromethylbenzyl)-2-phenylquinoline-4-carboxamide;

(-)-(S)-N-(α -ethylbenzyl)-3-methoxy-2-phenylquinoline-4-carboxamide;

(-)-(S)-N-(α -ethylbenzyl)-3-ethyl-2-phenylquinoline-4-carboxamide;

(R,S)-N-[α -(ethyl)-4-chlorobenzyl]-2-phenylquinoline-4-carboxamide;

15 (R,S)-N-[α -(methoxycarbonyl)benzyl]-N-methyl-2-phenylquinoline-4-carboxamide;

(R,S)-N-[α -(methoxycarbonyl)benzyl]-2-(3-thienyl)quinoline-4-carboxamide;

(R,S)-N-[α -(methoxycarbonyl)benzyl]-5,6-dihydrobenzo[a]acridine-7-carboxamide;

20 (R,S)-N-[α -(methoxycarbonyl)benzyl]-2-(2-pyrryl)quinoline-4-carboxamide;

(R,S)-N-[α -(methoxycarbonyl)benzyl]-2-(2-thiazolyl)quinoline-4-carboxamide;

25 (R,S)-N-(1-indanyl)-2-phenylquinoline-4-carboxamide;

(R,S)-N-(α -n-butylbenzyl)-2-phenylquinoline-4-carboxamide;

(R,S)-N-[α -(methoxycarbonyl)benzyl]-2-(4-methylphenyl)quinoline-4-carboxamide;

(R,S)-N-(α -heptylbenzyl)-2-phenylquinoline-4-carboxamide;

30 (R,S)-N-[α -(methoxycarbonyl)benzyl]-2-(2-methylphenyl)quinoline-4-carboxamide;

(R,S)-N-[α -(methoxycarbonyl)benzyl]-2-(4-methoxyphenyl)quinoline-4-carboxamide;

N-(1-phenylcyclopentyl)-2-phenylquinoline-4-carboxamide;

35 (R,S)-N-[α -(methoxycarbonyl)benzyl]-2-(4-hydroxyphenyl)quinoline-4-carboxamide;

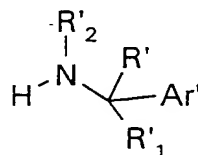
(R,S)-N-[α -(methoxycarbonyl)benzyl]-2-(3,4-

methylendioxyphenyl)quinoline-4-carboxamide;
 N-(α,α -dimethylbenzyl)-2-phenylquinoline-4-carboxamide;
 (R,S)-N-[α -(ethyl)-4-methylbenzyl]-2-phenylquinoline-4-carboxamide;
 (R,S)-N-[α -(methoxycarbonyl)benzyl]-2-(3-pyrryl)quinoline-4-
 5 carboxamide;
 (R,S)-N-[α -(methoxycarbonyl)benzyl]-2-(3,4-dichlorophenyl)quinoline-
 4-carboxamide;
 (-)-(R)-N-[α -(aminomethyl)benzyl]-2-phenylquinoline-4-carboxamide;
 (-)-(S)-N-(α -ethylbenzyl)-3-amino-2-phenylquinoline-4-carboxamide;
 10 (-)-(S)-N-(α -ethylbenzyl)-3-chloro-2-phenylquinoline-4-carboxamide;
 (-)-(S)-N-(α -ethylbenzyl)-3-bromo-2-phenylquinoline-4-carboxamide;
 (R,S)-N-(α -*iso*-propylbenzyl)-2-phenylquinoline-4-carboxamide;
 (-)-(S)-N-(α -ethylbenzyl)-2-phenylquinoline-4-carboxamide;
 (+)-(R)-N-(α -ethylbenzyl)-2-phenylquinoline-4-carboxamide;
 15 (R,S)-N-[α -(methoxycarbonyl)benzyl]-6-fluoro-2-phenylquinoline-4-
 carboxamide;
 (R,S)-N-[α -(methoxycarbonyl)benzyl]-2-cyclohexylquinoline-4-
 carboxamide;
 (R,S)-N-[α -(methoxycarbonyl)benzyl]-2-(3-chlorophenyl)quinoline-4-
 20 carboxamide;
 (R,S)-N-[α -(methoxycarbonyl)benzyl]-2-(2-chlorophenyl)quinoline-4-
 carboxamide;
 (R,S)-N-(α -ethylbenzyl)-3-hydroxy-2-phenylquinoline-4-carboxamide;
 (R,S)-N-[α -(methoxycarbonyl)benzyl]-8-acetyloxy-2-phenylquinoline-
 25 4-carboxamide;
 (R,S)-N-[α -(methoxycarbonyl)benzyl]-8-hydroxy-2-phenylquinoline-4-
 carboxamide;
 (R,S)-N-[α -(methoxycarbonyl)benzyl]-2-(2,4-dichlorophenyl)quinoline-
 4-carboxamide;
 30 (-)-(R)-N-[α -(methoxycarbonyl)-4-hydroxybenzyl]-2-phenylquinoline-4-
 carboxamide hydrochloride;
 N-diphenylmethyl-2-phenylquinoline-4-carboxamide;
 (-)-(S)-N-(α -ethylbenzyl)-3-hydroxy-2-phenylquinoline-4-carboxamide;
 (+)-(R)-N-(α -ethylbenzyl)-3-hydroxy-2-phenylquinoline-4-
 35 carboxamide;
 (-)-(R)-N-[α -(methoxycarbonyl)benzyl]-3-hydroxy-2-phenylquinoline-4-
 carboxamide;

- (-)-(R)-N-[α -(dimethylaminomethyl)benzyl]-2-phenylquinoline-4-carboxamide;
- (R,S)-N-[α -(dimethylaminocarbonyl)benzyl]-2-phenylquinoline-4-carboxamide;
- 5 (R,S)-N-[α -(aminocarbonyl)benzyl]-2-phenylquinoline-4-carboxamide;
- (R,S)-N-[α -(1-pyrrolidinylcarbonyl)benzyl]-2-phenylquinoline-4-carboxamide;
- (-)-(R)-N-[α -(carboxy)benzyl]-2-phenylquinoline-4-carboxamide hydrochloride;
- 10 (R,S)-N-[α -(methoxycarbonyl)benzyl]-2-(4-chlorophenyl)quinoline-4-carboxamide;
- (R)-N-[α -(methoxycarbonyl)-4-methoxybenzyl]-2-phenylquinoline-4-carboxamide;
- (R,S)-N-[α -(methoxycarbonyl)- α -(methyl)benzyl]-N-methyl-2-phenylquinoline-4-carboxamide hydrochloride;
- 15 (R,S)-N-[α -(methylcarbonyl)benzyl]-2-phenylquinoline-4-carboxamide;
- (R,S)-N-[α -(2-hydroxyethyl)benzyl]-2-phenylquinoline-4-carboxamide;
- (-)-(S)-N-(α -ethylbenzyl)-3-(2-dimethylaminoethoxy)-2-phenylquinoline-4-carboxamide hydrochloride;
- 20 (-)-(S)-N-(α -ethylbenzyl)-3-acetylamino-2-phenylquinoline-4-carboxamide;
- (-)-(S)-N-(α -ethylbenzyl)-3-(3-dimethylaminopropoxy)-2-phenylquinoline-4-carboxamide hydrochloride;
- (-)-(S)-N-(α -ethylbenzyl)-3-[2-(1-phthaloyl)ethoxy]-2-phenylquinoline-4-carboxamide hydrochloride;
- 25 (-)-(S)-N-(α -ethylbenzyl)-3-(2-aminoethoxy)-2-phenylquinoline-4-carboxamide hydrochloride;
- (+)-(S)-N-(α -ethylbenzyl)-3-[2-(1-pyrrolidinyl)ethoxy]-2-phenylquinoline-4-carboxamide hydrochloride;
- 30 (-)-(S)-N-(α -ethylbenzyl)-3-(dimethylaminoacetylamino)-2-phenylquinoline-4-carboxamide;
- N-(α,α -dimethylbenzyl)-3-hydroxy-2-phenylquinoline-4-carboxamide;
- N-(α,α -dimethylbenzyl)-3-amino-2-phenylquinoline-4-carboxamide;
- (-)-(S)-N-(α -ethylbenzyl)-5-methyl-2-phenylquinoline-4-carboxamide;
- 35 (R,S)-N-[α -(1-hydroxyethyl)benzyl]-3-methyl-2-phenylquinoline-4-carboxamide;
- (R,S)-N-[α -(methylcarbonyl)benzyl]-3-methyl-2-phenylquinoline-4-

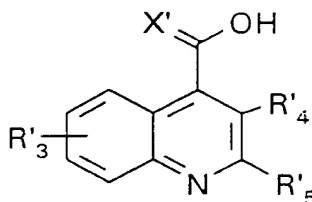
carboxamide;
 (R,S)-N-[α -(ethyl)-4-pyridylmethyl]-2-phenylquinoline-4-carboxamide;
 (R,S)-N-[α -(ethyl)-2-thienylmethyl]-2-phenylquinoline-4-carboxamide;
 (+)-(S)-N-(α -ethylbenzyl)-3-dimethylaminomethyl-2-phenylquinoline-
 5 4-carboxamide hydrochloride;
 (S)-N-(α -ethylbenzyl)-3-methyl-7-methoxy-2-phenylquinoline-4-
 carboxamide;
 (S)-N-(α -ethylbenzyl)-3-amino-5-methyl-2-phenylquinoline-4-
 carboxamide;
 10 (S)-N-(α -ethylbenzyl)-3-methoxy-5-methyl-2-phenylquinoline-4-
 carboxamide;

11 ~~12.~~ A process for preparing a compound of formula (I) as defined in
 claim 1, or a solvate or salt thereof which comprises reacting a compound of
 15 formula (III)



(III)

20 in which R', R'_1, R'_2 and Ar' are R, R_1, R_2 and Ar as defined for
 formula (I) or a group or atom convertible to R, R_1, R_2 and Ar, with a
 compound of formula (II)



(II)

25 or an active derivative thereof, in which R'_3, R'_4, R'_5 and X' are R_3,
 R_4, R_5 and X as defined for formula (I) or a group convertible to R_3, R_4, R_5
 and X, to form a compound of formula (Ic)